KCQ-S / KCQ-F

Inductive Reader

ATEX Certified for Explosive Atmospheres, Zone 1

- ATEX Directive Compliant
- Ultra-Low Power Consumption
- Battery Low Voltage Warning
- Large Memory
- Reliable Data Storage
- Impact Resistant
- IP65 Environmental Enclosure
- High Reliable Design, Very Low Maintenance
- Compact and Lightweight Ergonomic
- Visible and Audible Indicator
- Easy to Use

ISO 9001

OPERATION AND MAINTENANCE INSTRUCTIONS

Please Retain – Read Before Use

KCQ-S Issue 1, 2010/01

Bluecard ATEX Inductive Reader
Operation and Maintenance Instructions
Please Retain – Read Before Use

EC Declaration of Conformity

The Bluecard ATEX KCQ-S / KCQ-F Inductive Reader meets all relevant provisions of the 94/9/EC Explosive Atmospheres (ATEX Equipment) Directive by virtue of the issued EC type examination certificate, demonstrating compliance with all relevant harmonised standards and essential health and safety requirements.

The Bluecard ATEX KCQ-S / KCQ-F Inductive Reader is a self-contained portable Guard Tour Reader with a durable construction of anodized aluminium alloy tube inner and overmolding of thermoplastic elastomer enclosure. The Reader is powered by a replaceable Energy-Type CR-123A battery. The Bluecard ATEX KCQ-S / KCQ-F Inductive Reader is approved as Group II, Category 2 equipment for use in zone 1 & 2 potentially explosive gases, vapours, mists and dusts where the T4 temperature class/135℃ maximum surface temperature permits.

Approval Codes/Certification:

II 2 GD Ex ib IIB T4, Ex ib D 21 T135

Zones 1 & 2 ; Zones 21 & 22 (Temperature ambient -20℃ to +40℃)

EC Type examination certificate: **DNV 09 ATEX 54854**

Notified Body: **Det Norske Veritas Certificayion AS**

Veritasveien 1, 1363 Høvik, Norway

Notified body number: **0575**

Harmonised standards applied:

EN60079-0:2006, EN60079-11:2007, EN61241-0:2006, EN61241-1:2006

Ingress protection level: **IP65**

The Bluecard ATEX KCQ-S / KCQ-F Inductive Reader is certified compliant with the 89/336/EEC EMC Directive.

The product is CE marked showing compliance with all relevant EC Directives

Yin Jiuchun – Technical Director

Bluecard Software Technology Co., Ltd.

PRECAUTIONS

A. Use of Bluecard ATEX KCQ-S / KCQ-F Inductive Reader

Users should consult EN60079/IEC60079, or national equivalent, for advice on the selection and maintenance of electrical apparatus for use in potentially explosive atmospheres.

A damaged Bluecard ATEX KCQ-S / KCQ-F inductive Reader should be withdrawn, inspected and repaired in accordance with these instructions, before being put back into service.

Bluecard ATEX KCQ-S / KCQ-F inductive Reader must not be opened in the hazardous area.

B. To Replace Battery (Refer to Appendix I)

⚠ **WARNING: Battery must only be changed in an area known to be safe, and the battery must be genuine part from Bluecard.**

1） Use only the specified battery; non-rechargeable Energy-Type CR-123A battery, provided by Bluecard in part number: **CR-123A-ATEX**.
2） Strictly prohibit direct shorting the battery, please treat the used battery according to local regulations
3） Do not try to recharge the battery.

C. Inspection, Repair and Replacement

KCQ-S / KCQ-F inductive reader must be inspected and repaired by Bluecard. In case of a reader being damaged, please return the malfunction reader to Bluecard for repair or replacement according to limited warranty policy. Users must not try to repair the readers without manufacturer's permission.

The Bluecard Software Technology Co., Ltd. has a policy of continuous product improvement. Changes in design details may be made without prior notice.

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Overview

Thank you for purchasing the KCQ-S/KCQ-F inductive guard tour readers and other high quality products proudly brought to you by Bluecard.

This User Manual contains instructions for your safety in using KCQ-S/KCQ-F inductive guard tour readers, including chapters of Main Features, Specifications, Operating Instructions, Troubleshooting, etc.

Chapter 1：Introduction

1.1 Main Features

KCQ-S/KCQ-F Guard Tour Readers employ inductive data collection (RFID), and single-chip manufacturing technologies. The readers' operations are highly convenient. They detect and read RFID cards automatically. The KCQ-S/KCQ-F readers are used to collect data at checkpoints, and then upload data to the PC for processing and verification, and generating reports to show patrol records e.g. route, guard, location, time, and events. They have the following common features.

1.1.1 Ultra-low Power Consumption

Powered by one non-rechargeable Energy-Type CR-123A battery, which can be changed by following the battery replacement instruction (See Appendix I).

1.1.2 Impact Resistant and Water-proof

Reinforced aluminum alloy tubing with overmolding thermoplastic elastomers outer shell, completely sealed.

1.1.3 Large Memory

30,000 records memory capacity，

1.1.4 Reliable Data Storage

Flash Memory, stores data without electricity.

1.1.5 High Reliable Design

Adopts wireless communication technologies for transferring data to PC. The design helps to eliminate vulnerable parts, (e.g. buttons, sockets.) on the reader. Applying SMT workmanship, the terminals are compact, light-weighted, and easy to carry.

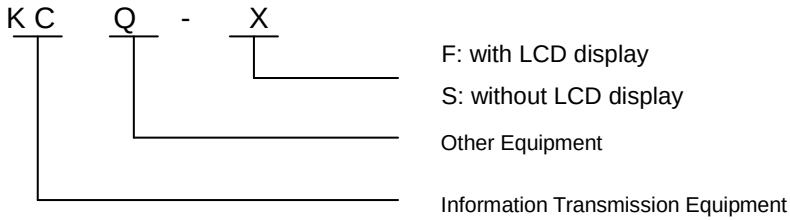
1.1.6 Easy to Use

Detects and reads RFID cards inside reading range automatically, no need to press button or direct touch of tags; and gives alert when battery goes low, or memory is full.

1.2 Applications

The rationale of the electronic patrol management system is that it is designed for the acquisition, evaluation and reporting of guard tour data. It works by installing a series of signal cards (also called check points, inductive cards or information buttons, each with its own unique identification number) along patrol routes, and having patrolling personnel performs readings on the cards they pass using hand held readers. The recorded cards ID codes and associated time-stamps are uploaded to computers later for processing and verification. The software is also able to generate reports instantly, which facilitates managers to review individual patrol performance quickly (e.g. attendance, locations patrolled, timeliness, events, etc).

1.3 Model



1.4 Working Conditions

Ambient temperature: **-20℃～40℃**
Atmospheric pressure: **86 kPa～106 kPa**
Average relative humidity: **≤95%（+25℃）**
Destructing insulating gas: **none**

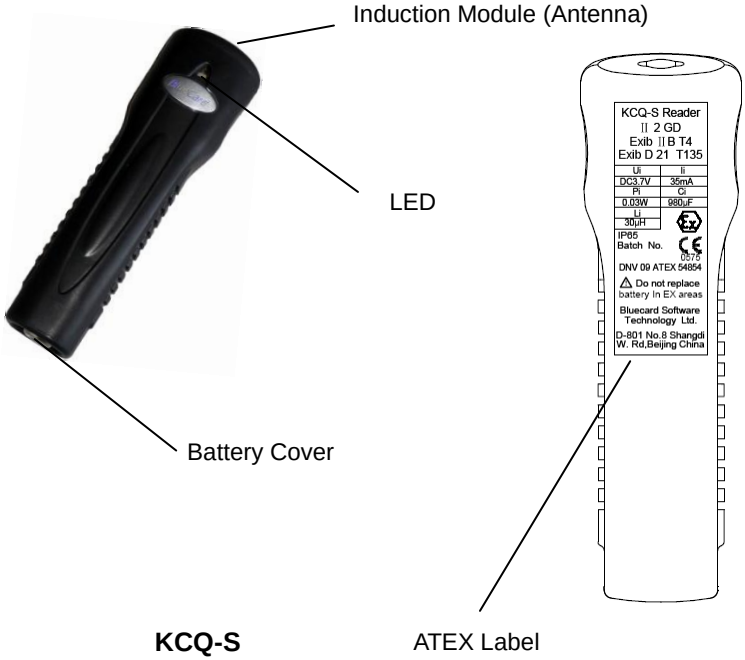
1.5 Type of Explosion Proof Construction

Protection concept: Intrinsic Safety Type
Use in: Zones 1, 2; Zones 21, 22
Approval codes: **II 2 GD Ex ib IIB T4, Ex ib D 21 T135**

Chapter 2：Structure Figures and Schematic

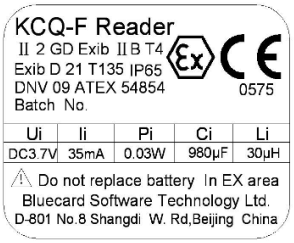
2.1 Structure Figures

Aluminum alloy tubing (material code: LY12) with overmolding thermoplastic elastomers outer shell (PVC material). Impact resistant and water-proof design to prevent readers from sabotage; streamline shape and ergonomics design to make readers easy to use. Figures of main structures are as following.



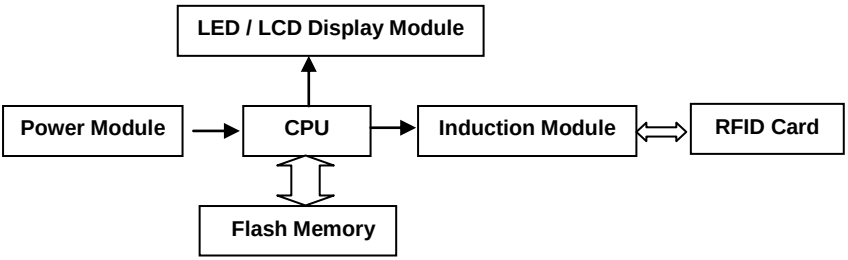
KCQ-S ATEX Label

KCQ-F


KCQ-F Reader
II 2 GD Exib IIB T4
Exib D 21 T135 IP65
DNV 09 ATEX 54854
Batch No.
0575
Ui Ii Pi Ci Li
DC3.7V 35mA 0.03W 980μF 30μH
Do not replace battery In EX area
Bluecard Software Technology Ltd.
D-801 No.8 Shangdi W. Rd,Beijing China

ATEX Label

2.2 Schematic



Schematic Diagram

2.2.1 CPU

Hard-core of the whole system, coordinated control of work among other parts of the system.

2.2.2 Power Module

Power Supplier of the whole system.

2.2.3 Display Module

Displays information of working status or prompt.

2.2.4 Flash Memory

Store reading records

2.2.5 Induction Module

Module to detect, activate RFID card and read it.

2.2.6 RFID Card

Powered by KCQ-S/F reader and transmits its ID code by radio.

Chapter 3： Mechanism and Specifications

3.1 Mechanism

3.1.1 Reading Mode

Inductive coupling RFID system.

3.1.2 Display Mode

LED display (KCQ-S); LED and LCD Display (KCQ-F only).

3.1.3 Data Upload Mode

Wireless communication with Bluecard Communication Station (Purchase separately)

3.1.4 Low Voltage Alert Mode

If the battery voltage goes lower than 2.4V DC, the LED indicator will keep flashing.

3.1.5 Battery Power Saving Mode

When no card or the same card is detected incessantly after a certain time, the reader will switch to the idle mode automatically for maximum power saving.

3.2 Specifications

3.2.1 Reading Range

Max. Reading range: no less than 3.0cm

3.2.2 Radio Specifications

a) Working Frequency: 125 KHz
b) Frequency Deviation: ±5%;
c) Field Density（3cm dead ahead the antenna）: 0.001948（A/M）≤H≤0.002105（A/M）

3.2.3 Antenna Coil Parameters

a) Voltage: AC <35V (effective value), <100V (P-P value);
b) Current: AC <3mA

3.2.4 Battery Parameters

a） Rated voltage: 3.0V DC
b） Max shortcut current: <9.1A DC
c） Specified Model：Energy-Type CR-123A battery only, non-rechargeable
d） Number of battery: 1

3.2.5 Electrical Data

a） Ui: DC 3.7V;
b） Ii: 35mA;
c） Pi: 0.03W;
d） Ci: 980μF;
e） Li: 30μH;

3.2.6 Memory Capacity

≥30,000 records, gives prompt information when the memory is full

3.2.7 Power Fluctuation Adaptability

When the battery voltage is within 2.5V~3.7V DC, the reader's electrical characteristics meets its standard.

Dimensions	130x30x26mm
Weight	158g
Rated Working Voltage	3.0V DC
Working Current	≤32mA
Power Consumption	50mW

Chapter 4：Operation Instructions

4.1 Before use (Set up the reader)

Before reading RFID cards, please synchronize the reader's time with a PC, and initialize the reader to remove unwanted legacy records. A Bluecard's Communication Station (Available by purchased separately) is required for initial setup process. (For more details on reader setup, please refer to the User Manual of Patrol Management System). Remove reader from the Communication Station after synchronization and initialization and wait for the reader to shut down itself automatically before performing readings.

4.2 Power on

The reader will wake up and switch on automatically to perform card reading when a valid RFID card appears within its reading range.

4.3 Read cards

Move the reader closed to an tag (RFID EM) with its reading head (refer to figures in chapter 2.1) towards the tag. When a read is made, the reader will flash four times and beep once immediately.

4.4 Shut down

The reader will switch to idle mode in 10 seconds after a successful read or the same tag is presented continually.

4.5 Data upload

The readers depend on Bluecard's Communication Station (Available by purchased separately) to upload data to PC. Bluecard supply multiple compliant station models for convenient local or remote data upload. (Refer to User Manuals of Communication Stations for more details.)

Chapter 5：Status Indication List

5.1 1 beep with 4 flashes

Reading is successful.

5.2 2 beeps with 2 flashes

Memory is about full, less than 1000 new records can be stored.

5.3 4 beeps with 4 flashes

Memory is full, data needs to be uploaded before storing more reads.

5.4 After reading a card, LED keeps flashing

The battery power is low and needs to be changed.

5.5 8 beeps with 8 flashes

An inner error occurred. The reader needs to be initialized.

Notes: Make sure all data has been uploaded to PC before starting to initialize the reader, as initialization will permanently delete all data from the reader!

Chapter 6：Troubleshooting

6.1 Inaccurate clock

Needs to do synchronization. When the reader communicates with PC, it will be synchronized to the PC's clock (Bluecard's Communication Station is required).

6.2 Failed to read RFID card

Solution 1: After communicating with the PC, wait for 10 seconds before starting to make a new reading.

Solution 2: Make sure the card is not read within 2 seconds of the previous reading.

Solution 3: In case of reading the same card more than once is required, please move the reader away from the reading range for more than 3 seconds so that the reader gets ready for reading again.

Solution 4: The reader's memory may be full. Connect it to a PC via certain Bluecard's Communication Station to upload data before reading more cards.

6.3 Cannot turn on

Replace a new correct battery. (See below: **Appendix I**).

Chapter 7：Conditions of Transportation and Storage

7.1 Transportation Conditions

Avoid the rain and snow, the worst transportation conditions can be withstood are as follows:

Temperature: -20℃~+60℃;

Average Relative Humidity: ≤95%（+25℃）;

Vibration: 20m/s2;

Impact: 500m/s2

7.2 Storage Conditions

After packing, the reader can be stored at the place of good ventilation, non corrosive gas, non sulfureted hydrogen and organosilicon vapor, non fierce vibration.

Charter 8：Enclosed Documents and Accessories

Please check with the packing list carefully when you open the package received from Bluecard.

a) **KCQ-S reader: 1**
b) **User Manual: 1**
c) **Warranty Card: 1**
d) **Quality Certificate: 1**

Appendix I：Battery Replacement Instructions

Tools you need

1, Metallic Tweezers

Or

2, Special Wrench（Purchase separately from Bluecard） 2, Needle-nose Pliers

⚠ **WARNING: Do not try to open the KCQ-S/KCQ-F reader in potentially explosive atmosphere!**

Make sure you are in an area known to be safe before conducting the following procedures.

1. Place the reader in a bottom-up position. You will see its battery cover. Peel the label from the battery cover, and two round depressions appear.

2. Use a special wrench or needle-nose pliers to hold onto the depressions and turn the battery cover counterclockwise to screw off and remove it.

3. Take out the old battery and silicon rubber, and then you'll see the anode contact point locating at the center of the bottom of battery compartment. (Create a shortcut between the anode contact and the battery compartment wall for approximately 2-5 seconds by using a metallic tweezers.)

4. Place the silicon rubber back, an put in a new battery. Check the O-ring on the battery cover, replace it with a new one if it's broken. And then re-assemble the battery cover. When screwing down the battery cover, please note the notch on the inside of aluminum tube. The plane surface of battery cover should go down to the same level as the bottom of the notch.

5. If the reader sounds a long beeping with LED flashing when or after battery cover re-assemble, it indicates the reader is resetting itself. Please wait for one minute before testing the reader. Now the reader should work normally, please synchronize the reader before further usage as the instruction in charter 4.1 "***Before use***"

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